PROGRAMMABLE TELEPHONE SWITCHER

BACKGROUND AND SUMMARY OF THE INVENTION

This invention relates generally to telephone switching equipment for connection to the user side or customer side of the telephone network interface. More particularly, the invention relates to a switching apparatus which may be programmed by the user or incoming caller to route the incoming call from a standard telephone device or outside line to one or more multiple standard telephone devices or other outside lines according to preprogrammed instructions or access codes.

Many households and small businesses have several standard telephone devices connected to a single outside telephone line, for the convenience which multiple telephones can afford. With such an arrangement, an incoming call will normally ring every telephone connected to the outside line, unless one or more of the telephone device ring circuits have been disabled. Once the call is answered, there is no privacy between telephone devices; a party can simply pick up the handset of an unused telephone to monitor or join in another party's telephone conversation. While convenient at times, this lack of privacy can create problems.

In addition to the privacy problem, standard telephone devices are also deficient in screening incoming calls. Add-on call screening devices are available to screen out callers who do not have the correct password or access code, however, these devices have shortcomings. For instance, these devices lack security; once the correct access code has been entered, the incoming call may be taken by or monitored by any one or more of the telephone devices connected to the system as discussed above. Another disadvantage is that unless the caller dials a correct access code, that caller is simply disconnected—nonauthorized callers cannot even leave a message on an answering machine. Also, most prior art call screening devices intercept the telephone ring signal and silence the normal telephone ringer circuit. Such devices are typically not capable of energizing the ringer circuits in one or more standard telephone devices and must, therefore, provide an external electronic ring simulating apparatus. Many persons who are accustomed to answering a ringing telephone find the simulated ringing to be disconcerting, particularly when the ringing emanates from an apparatus located somewhere other than the telephone.

In order to provide greater convenience to the home and small business telephone user, the present invention provides a programmable switching device which selectively channels incoming calls from standard telephone devices or an outside line or lines to one or more other standard telephone devices, including answering machines modems, and the like, or to other outside lines. The device channels the incoming calls according to a predefined priority and/or according to an access code dialed by the calling party. In the latter case the dialed access codes correspond to the actual devices which are desired to be accessed. For greater flexibility, each telephone device may be assigned more than one access code. The unit can also be programmed to allow callers who do not dial a valid access code to be connected to a predefined telephone device, such as an answering machine.

Accordingly, it is an object of the present invention to provide a telephone switching device which incorporates the call screening abilities described above, whereby the calling party can select which telephone device or devices should respond to the call.

Another object of the invention is to provide a screening telephone call diverter which generates a standard ring voltage signal capable of energizing the ringer circuits of standard telephone devices.

It is another object of the invention to provide a programmable telephone switching apparatus which will enable the household or small business telephone user to incorporate a number of other sophisticated features into the telephone system. Such features include an intercom feature, whereby two telephone devices within the system can communicate with one another by simply dialing an appropriate access code. Another such feature is a hold feature, whereby any inside telephone device can put any other inside device or an outside line on hold, while optionally communicating with any other inside device or outside line.

Yet another highly desirable feature is a memory dialer, affording each of the standard telephone devices a separate automatic dialing list.

Yet another object of the invention is to provide an automatic telephone dialing signal protocol converter which automatically tests the outside line and converts a standard telephone device dial signal from pulse to tone or from tone to pulse, according to the comptability of the calling device and the telephone company being accessed.

A further object of the invention is to provide a screening telephone call diverter which automatically connects a first telephone device to the first available outside line, as soon as that device is lifted off hook, while optionally allowing or locking out all other telephone devices which may wish to access that same line, thereby providing a greater degree of privacy.

Yet another object of the invention is to provide a programmable telephone switching apparatus which implements an automatic call forwarding feature, allowing incoming calls to be automatically channeled to an outside line. The apparatus then automatically dials a preprogrammed phone number on that line to thereby forward the incoming call. If desired, the call forwarding apparatus may include a sequential call forwarding feature which will divert the incoming calls sequentially to different telephone devices (or outside lines) according to a preprogrammed, prioritized search list. If the incoming call is not answered by the first forwarding number in the list, successive numbers from the list are tried until the call is completed or until the programmed sequence is exhausted.

Another object is to provide a call screener which can be placed in a learn mode to analyze and digitally record an audio beeper tone like that produced by a remote control device. Such remote control devices are included with some answering machines to allow the owner to retrieve messages by calling home and using the beeper to activate playback. The invention makes it possible to access that remote control feature without having to carry a beeper. The digitally stored beeper tone is produced by the invention upon receiving a predetermined dialed access code.

These and other objects and advantages of the invention will become more apparent from the following detailed description when read in conjunction with the accompanying drawings.